Escalator Solid Side Truss Construction

The present invention relates to escalators and moving walkways, and in particular, to a new and improved truss construction therefor.

Background of the Invention

Conventional escalator and moving walkways (hereinafter generally referred to as "escalators") utilize a support construction formed of steel channel elements. Such constructions are heavy, and because of the numerous welds typically required, are both expensive and time consuming to build. Constructions utilizing such channel elements incorporating cut-out sections to lessen the weight and limit construction steps have been proposed. See, for example, European patent application EP 1 074 507A1. Such constructions, however, still require numerous operations and are not totally cost effective.

It is accordingly a purpose of the present invention to provide an escalator support construction of improved design which has significant cost benefits over the manufacturing costs of conventional truss designs.

Brief Description of the Invention

In accordance with the stated purpose, an escalator truss construction in accordance with the present invention utilizes a quasi-corrugated wall construction fastened to upper and lower profile elements. By incorporating a corrugated wall, the more complex fastenings, such as welds, for channel members are eliminated. The truss can be fabricated in any length required without extensive set-up and change-over costs. In addition, both the corrugated wall as well as preferred profile sections for the upper and lower supports can be formed from sheet steel by relatively simple bending processes, reducing material costs for the product. Additional cross member supports can be similarly fabricated from sheet steel as required, and welded or otherwise affixed to the sides to provided any additional escalator component supports.

Brief Description of the Drawings

A fuller understanding of the present invention will be achieved upon consideration of the following, detailed description of a preferred, but nonetheless illustrative embodiment thereof, when reviewed in conjunction with the annexed drawings, wherein:

FIG. 1 is a side elevation view of a conventional escalator side truss construction;

FIG. 2 is a schematicized side elevation view of an escalator truss constructed in accordance with the present invention;

FIG. 3 is an exploded view of a typical truss unit in accordance with the invention; and

FIG. 4 is an end elevation view depicting the mounting of intermediate escalator side supports upon a pair of trusses.

Detailed Description of the Invention

In distinction to a conventional escalator truss as depicted in Fig. 1 having a matrix of carefully aligned and precisely dimensioned angle members joined together, such as by a complex set of welds, to form the truss, the present invention, as depicted in Figs. 2-4, utilizes a simple assembly, as detailed in Fig. 3, to provide a truss assembly 10 of high strength and simplified manufacture. With initial reference to Fig. 3, the escalator side truss, of which there are two in a typical escalator construction, comprises a main corrugated panel 12 joined along its top and bottom edges to a pair of upper and lower channel elements 14, 16. The combination of the corrugations of the panel 12 and the L-shape top and bottom channel elements provide an integrated construction of substantial rigidity, able to be formed in any length required in an economical manner. The corrugated panel 12 is fixed to the channel elements 14 and 16 by conventional fastenings as known in the art, including simple welds and/or rivet fastenings.

As further illustrated in FIG. 2, the corrugation fold lines 18 are perpendicular to the length of the top and bottom channel elements and to the run of the truss, and thus are also perpendicular to the truss's incline upon installation. Thus truss assembly 10 is preferably formed in the shape of a parallelogram, with a central, rectangular area to be formed by the main corrugated panel 12 and a pair of trapezoidal or triangular end pieces 20 to provide a vertical end wall portion 22 to allow the truss to be joined to terminating portions as known in the art. The end pieces 20 may be of flat plate stock. If further rigidity is required at the ends, the end pieces 20 may be provided with bent end sections corresponding in depth to the depth of the corrugations. The end pieces may also be welded, riveted or otherwise joined to the corrugated panel 12 and top and bottom channel elements.

As depicted in Fig. 4, in addition to the upper and lower channel elements 14, 16, intermediate brackets 24, 26 may be mounted to the inwardly directed faces of the truss assembly 10 to provide the necessary support or guidance for the escalator components, such as the trail and axle rollers of the step assembly. The brackets are simply aligned and mounted to the inner corrugation walls of the panel 12 as appropriate.

The upper and lower channel elements 14, 16 may be of 10 or 11 gauge, with a typical height of about 5 inches and a horizontal width of about 3 inches. The thickness of panel 12 may vary, depending on the rise of the escalator, but is typically between 11 and 16 gauge. The corrugations may have a depth on the order of 3 inches, while the exterior portions 28 in Fig. 3 are on the order of 18 inches in width and the interior portions 40 are on the order of 6 inches in width. The widths may be adjusted in accordance with strength requirements, the inclusion of more bends or corrugations per unit length adding strength at the expanse of greater weight. In addition, the corrugation dimensions can be varied along the length of the truss to minimize the amount of steel needed in areas where lesser stresses are present. The gauge and size of the intermediate brackets 24, 26 are of comparable dimensions, chosen in accordance with the requirement of the components supported.